

App. Ser. No. 10/634,779  
Docket No. SH-0037US  
RYU.014

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### REMARKS

Entry of this Amendment is proper since it narrows the issues on appeal and does not require further searching by the Examiner.

Claims 1-10 and 20-28 and 30-31 are all the claims presently pending in the application. Claims 1, 2, 7, 8, 10, 20, 25, 27 and 30-31 have been amended to more particularly define the claimed invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1-10, 20-28 and 30-31 stand rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite.

Claims 1-4, 6-10, 25-27 and 31 stand rejected under 35 U.S.C. § 102(b) as allegedly unpatentable over Bachmann et al. (U. S. Pat. No. 5,067,793). Claims 5, 28 and 30 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Bachmann.

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Bachmann et al. in view of Rau et al. (U.S. Patent No. Re. 30,883).

These rejections are respectfully traversed in view of the following discussion.

#### **I. THE CLAIMED INVENTION**

The claimed invention (e.g., as defined by claim 1) is directed to an optical fiber preform from which an optical fiber may be formed by drawing. The optical fiber preform includes a multi-layer structure including an inside portion disposed at an inner side of the radial direction of a position corresponding to two times of mode field diameter through which light having a wavelength of about 1385 nm propagates when the light passes through an optical fiber made by drawing the preform, and an outside portion disposed at an outer side of the inside portion, wherein at a temperature  $T_s$ , a maximum value  $V_0$  [log(poise)] of a radial viscosity distribution in

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the outside portion is greater than 7.60 [log(poise)] and a maximum value  $V_0$ [log(poise)] of radial viscosity distribution in the inside portion is 7.60 [log(poise)].

Importantly, the multi-layer structure also includes an outermost portion formed on the outer portion and having a viscosity less than  $V_0$  at the temperature  $T_s$  (Application at page 12, lines 10-28).

When the most outside layer of an optical fiber is a high viscosity clad layer the strength of the optical fiber may be lowered (Application at page 12, lines 10-12).

The claimed invention, on the other hand, includes a multi-layer structure including an outermost portion formed on the outer portion and having a viscosity less than  $V_0$  at the temperature  $T_s$  (Application at page 12, lines 10-28). This may help to improve the strength of the optical fiber.

## II. THE 35 USC §112, SECOND PARAGRAPH REJECTION

The Examiner alleges that claims 1-10, 20-28 and 30-31 are indefinite. Applicant would point out, however, that claims 1, 20, 27 and 31 have been amended to address the Examiner's concerns.

Thus, Applicant respectfully submits that claims 1-10, 20-28 and 30-31 are clearly defined and not indefinite. Therefore, in view of the foregoing, the Examiner is respectfully requested to withdraw this rejection.

## III. THE ALLEGED PRIOR ART REFERENCES

### A. Bachmann

The Examiner alleges that Bachmann teaches the claimed invention of claims 1-4, 6-10, 25-27 and 31, and makes obvious the invention of claims 5, 28 and 30. Applicant would submit, however, that there are elements of the claimed invention which are neither taught nor suggested by Bachman.

Bachmann discloses a single mode optical fiber having a core and at least one cladding layer with a refractive index which is smaller than the refractive index of the core (Bachmann at

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col. 4, lines 13-25).

However, Bachmann does not teach or suggest a preform including a multi-layer structure including "an outermost portion formed on said outer portion and having a viscosity less than  $V_0$  at the temperature  $T_s$ ", as recited, for example, in claims 1, 20 and 31 (Application at page 12, lines 10-28). As noted above, this may help to improve the strength of the optical fiber.

Clearly, these features are not taught or suggested by Bachmann.

Indeed, Bachmann simply discloses an optical fiber with a multiple number of clad layers and an outer tube of quartz glass. Bachmann fails to teach or suggest the "outermost portion" of the claimed invention.

Specifically, Bachmann teaches a preform which includes on an inside of a quartz glass tube 4, a quartz glass layer 4A, a doped quartz glass layer 3, another doped quartz glass layer 2, and another doped quartz glass layer 1 (Bachman at col. 3, lines 12-26). Bachmann makes absolutely no reference to the viscosities of any of the layers in the preform. Moreover, Bachmann certainly does not teach or suggest any preferred relationship between the viscosities of any of these layers.

The Examiner attempts to equate the "multiple layers of claddings" in Bachmann (e.g., layers 1, 2, 3, 4A and 4) with the multi-layer structure of the claimed invention. This is clearly unreasonable.

Indeed, nowhere does Bachmann teach or suggest that layer 4 has a viscosity at temperature at a temperature (e.g.,  $T_s$ ) which is less than a viscosity of layers 2 and 3. In fact, Bachmann teaches that the layer 4 is formed of quartz crystals or synthetic quartz, whereas layer 4A is formed of synthetic quartz glass and layers 1-3 are formed of doped quartz glass (Bachmann at col. 3, lines 15-43). Since, a viscosity of quartz glass may be lowered by doping, it is likely that the layer 4 has a viscosity which is at least as great as the layers 1, 2, 3, and 4A.

That is, nowhere does Bachmann teach or suggest that layer 4 may have a viscosity at a temperature (e.g.,  $T_s$ ) which is less than a viscosity of layers 2 and 3. Therefore, Bachman clearly does not teach or suggest the claimed invention.

Therefore, Applicant would respectfully submit that there are elements of the claimed

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invention that are not taught or suggested by Bachmann. Therefore, the Examiner is respectfully requested to withdraw this rejection.

**B. Rau**

The Examiner alleges that Bachmann would have been combined with Rau to form the invention of claim 5. Applicant would submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Rau discloses a method of producing a fluorine-containing synthetic quartz glass in which a hydrogen-free silicon compound is heated in a hydrogen-free gas stream while the gas stream is passed through an induction coupled plasma burner (Rau at Abstract).

However, Applicant would submit that these references would not have been combined as alleged by the Examiner. Specifically, in contrast to Bachmann which is directed to a method of making a single mode optical fiber, Rau is merely intended to improve a method of producing fluorine-containing synthetic quartz glass. Thus, Rau is unrelated to Bachmann, and no person of ordinary skill in the art would have considered combining these disparate references, absent impermissible hindsight.

Further, Applicant would submit that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, contrary to the Examiner's allegations, neither of these references teach or suggest their combination. Therefore, Applicant would respectfully submit that one of ordinary skill in the art would not have been so motivated to combine the references as alleged by the Examiner.

Specifically, the Examiner again refuses to support the alleged combination. Indeed, the Examiner again attempts to support the alleged combination by stating "[b]ecause Rau teaches a synthetic quartz glass whose index of refraction can be varied in a prescribed manner with the use of dopants ..., it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the synthetic doped quartz glass of Rau as the doped quartz of Bachmann" (Office Action at page 6).

Therefore, the Examiner has failed to make a prima facie case of obviousness.

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Moreover, neither Bachmann, nor Rau, nor any alleged combination thereof teaches or suggests "*an outermost portion formed on said outer portion and having a viscosity at temperature  $T_s$  which is less than a viscosity of said outside portion*", as recited, for example, in claim 1 (Application at page 12, lines 10-28). As noted above, this may help to improve the strength of the optical fiber.

Clearly, these features are not taught or suggested by Rau. Indeed, the Examiner again attempts to rely on col. 2, lines 11-32 and 39-43, and col. 3, lines 19-37 in Rau to support her allegations. However, nowhere do these passages teach or suggest the novel features of the claimed invention.

In fact, as noted above, these passages in Rau merely disclose a method of producing fluorine-containing synthetic quartz glass. Nowhere do these passages even teach or suggest a preform including an outermost portion formed on the outer portion and having a viscosity at temperature  $T_s$  which is less than a viscosity of the outside portion (Application at page 12, lines 10-28).

Thus, like Bachmann, Rau is unrelated to the claimed invention. Thus, Rau clearly does not make up for the deficiencies in Bachmann.

Therefore, Applicant would submit that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

#### IV. FORMAL MATTERS AND CONCLUSION

Claim 31 has been amended to address the Examiner's objections thereto.

In view of the foregoing, Applicant submits that claims 1-10 and 20-28 and 29-31, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

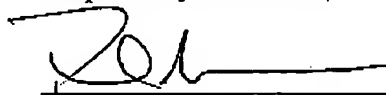
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The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 3/30/07

Phillip E. Miller, Esq.  
Registration No. 46,060

McGinn IP Law Group, PLLC  
8321 Old Courthouse Road, Suite 200  
Vienna, VA 22182-3817  
(703) 761-4100  
Customer No. 21254

**CERTIFICATE OF FACSIMILE TRANSMISSION**

I hereby certify that the foregoing was filed by facsimile with the United States Patent and Trademark Office, Examiner Elizabeth Ivey, Group Art Unit # 1775 at fax number (571) 273-8300 this 30th day of March, 2007.



Phillip E. Miller  
Reg. No. 46,060